

REMARKS

The Applicant respectfully requests further examination and consideration in view of the amendments above and the arguments set forth fully below. Prior to this Office Action, Claims 1, 3-6, 9-19, 22-28, 30-33, and 36-60 were pending in this application. Within the Office Action, Claims 1, 3-6, 9, 15-19, 22, 28, 30-33, 36, 42-44, 46-50, 52-56, and 58-60 are rejected, and Claims 10-14, 23-27, 37-41, 45, 51, and 57 are objected to. By the above amendments, Claims 1, 15, 28, 45, 51, and 57 are amended. Accordingly, Claims 1, 3-6, 9-19, 22-28, 30-33, and 36-60 are currently pending in this application.

Within the Office Action, it is stated that the limitations stated in dependent Claims 10 and 45 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. Claim 10 states that “wherein two new contention slots are generated, allocated according to the request and grant mode, and placed in the weighted fair queue when a collision occurs between two users.” Claim 45 states that “wherein if multiple new user access requests cause a collision, a number of additional contention slots are generated according to the request and grant mode, such that the number of additional contention slots corresponds to at least a number of the multiple user access requests causing the collision, thereby increasing the first number of contention slots by the number of additional contention slots.”

By the above amendments to independent Claims 1, 15, and 28, similar limitations as the objected to Claims 10 and 45 are added. Specifically, the independent Claims 1, 15, and 28 are amended to include “wherein if multiple new user access requests cause a collision, then a number of additional contention slots are generated and allocated according to the request and grant mode.”

Rejections Under 35 U.S.C. § 103

Within the Office Action, Claims 1, 3, 4-6, 15, 16, 17-19, 22, 28, 30, 31-33, 36, 42-44, 46-50, 52-56, and 58-60 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,892,769 to Lee in view of U.S. Patent No. 6,353,617 to Cadd et al. (hereinafter “Cadd”). The Applicant respectfully traverses these rejections.

The present invention is directed to a wireless network that utilizes a central hub and a number of end user nodes (EUNs). An upstream communication channel is divided into time slots and is shared by many EUNs. As each time slot is available to many EUNs, contention between the EUNs exists for access to the time slots. The time slots are therefore also referred to as contention slots. Since only one EUN is allowed to transmit at a time, EUN transmission for each contention slot is coordinated using a contention mode or a request and grant mode.

The present invention allocates a queue in a weighted fair queue to generate contention slots, where each contention slot is designated for either the request and grant mode or the contention mode. Idle end user nodes (EUNs) utilize a contention slot designated for contention mode to request access. If a collision occurs between two idle end user nodes requesting access using the contention slot designated for contention mode, two new contention slots designated for request and grant mode are generated, and the newly generated slots are placed in the weighted fair queue. The previously idle EUNs are now considered active EUNs, where each active EUN utilizes a request and grant contention slot. The number of contention slots designated for request and grant mode increases and decreases according to the number of EUN access requests.

Lee is directed to a method and system of contention-based multiple access for a reservation sub-channel and contention-free access for a data sub-channel. The reservation sub-channel utilizes reservation slots and the data sub-channel utilizes data slots. The users transmit reservation messages in the reservation slots to contend for the privilege to transmit data messages in the data slots. In the event of a collision in the reservation slots, a prioritized contention resolution algorithm is used to resolve the collision. Users are designated according to diverse Quality of Service (QoS) requirements, and as such, each user is assigned a specific priority class. An inter-priority collision is a collision that involves at least two users who belong to different priority classes. The prioritized contention resolution algorithm is used to resolve each inter-priority collision in favor of the highest priority class that is involved in the collision. When there is an intra-priority collision, the algorithm proceeds to resolve the collision using an existing non-prioritized contention resolution algorithm. There is no hint, teaching, or suggestion within Lee that indicates an additional number of data slots are generated when there is a collision in a reservation slot.

Cadd is directed to a random access system in which an end user communicates with a central controller. A frame structure is defined in which communications are organized and transmitted over the random access system using a series of frames. Each frame, such as frame

28 and frame 30 in Figure 1 of Cadd, include a control slot 20, and a series of contention slots 24. The control slot 20 is allocated in each frame to provide call setups and other outgoing information from the central controller (Cadd, col. 3, lines 11-14). The contention slots (contention slots 24) are exclusively allocated according to a contention mode. Cadd does not teach allocating a contention slot according to a request and grant mode. Therefore, since Cadd does not teach a request and grant mode, Cadd also does not teach generating an additional number of request and grant mode slots when there is a collision in a contention mode slot.

The independent Claim 1 is directed to a method of integrating a scheduling algorithm in a wireless network shared by a plurality of users. The method includes generating one or more contention slots, allocating a first number of contention slots according to a request and grant mode, wherein the first number is determined by a number of user access requests, further wherein each one of the number of user access requests corresponds to a different one of the first number of contention slots, allocating a second number of contention slots according to a contention mode, prioritizing the first number of contention slots and the second number of contention slots, and dynamically adjusting the first number of contention slots according to a change in the number of users requesting access, wherein if multiple new user access requests cause a collision, then a number of additional contention slots are generated and allocated according to the request and grant mode. As discussed above, neither Lee, Cadd, nor their combination teach generating and allocating an additional number of request and grant mode contention slots when there is a collision in a contention mode slot. Further, it is acknowledged in the Office Action that similar limitations are allowable. For at least these reasons, the independent Claim 1 is allowable over Lee in view of Cadd.

Claims 3, 4-6, 42-44, and 46-47 are dependent on the independent Claim 1. As discussed above, Claim 1 is allowable over the teachings of Lee in view of Cadd. Accordingly, Claims 3, 4-6, 42-44, and 46-47 are each also allowable as being dependent upon an allowable base claim.

The independent Claim 15 is directed to an apparatus for integrating a scheduling algorithm in a wireless network shared by a plurality of users. The apparatus includes means for generating one or more contention slots, means for allocating a first number of contention slots according to a request and grant mode, wherein the first number is determined by a number of user access requests, further wherein each one of the number of user access requests corresponds to a different one of the first number of contention slots, means for allocating a second number of contention slots according to a contention mode, means for prioritizing the first number of

contention slots and the second number of contention slots, and means for dynamically adjusting the first number of contention slots according to a change in the number of users requesting access, wherein if multiple new user access requests cause a collision, then a number of additional contention slots are generated and allocated according to the request and grant mode. As discussed above, neither Lee, Cadd, nor their combination teach generating and allocating an additional number of request and grant mode contention slots when there is a collision in a contention mode slot. Further, it is acknowledged in the Office Action that similar limitations are allowable. For at least these reasons, the independent Claim 15 is allowable over Lee in view of Cadd.

Claims 16, 17-19, 22, 48-50, and 52-53 are dependent on the independent Claim 15. As stated above, Claim 15 is in a condition for allowance. Accordingly, Claims 16, 17-19, 22, 48-50, and 52-53 are each also allowable as being dependent upon an allowable base claim.

The independent Claim 28 is directed to an apparatus for integrating a scheduling algorithm in a wireless network channel shared by a plurality of users. The apparatus includes a hub for transmitting and receiving wireless network signals such that the hub may receive requests and assign portions of a communication bandwidth, a plurality of end user nodes for transmitting and receiving wireless network signals such that a plurality of users may request or be granted a portion of the communication bandwidth, and a weighted fair queue for utilizing an adaptive contention scheduling scheme to generate one or more contention slots, to allocate a first number of contention slots according to a request and grant mode, wherein the first number is determined by a number of user access requests, each one of the number of user access requests corresponds to a different one of the first number of contention slots, to allocate a second number of contention slots according to a contention mode, to prioritize the first number of contention slots and the second number of contention slots, and to dynamically adjusting the first number of contention slots according to a change in the number of active users requesting access, wherein if multiple new user access requests cause a collision, then a number of additional contention slots are generated and allocated according to the request and grant mode. As discussed above, neither Lee, Cadd, nor their combination teach generating and allocating an additional number of request and grant mode contention slots when there is a collision in a contention mode slot. Further, it is acknowledged in the Office Action that similar limitations are allowable. For at least these reasons, the independent Claim 28 is allowable over Lee in view of Cadd.

Claims 30, 31-33, 36, 54-56, and 58-60 are dependent on independent Claim 28. As stated above, Claim 28 is in a condition for allowance. Accordingly, Claims 30, 31-33, 36, 54-56, and 58-60 are also in a condition for allowance.

Within the Office Action, Claims 9, 22, and 36 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Lee in view of Cadd and further in view of U.S. Patent No. 6,785,252 to Zimmerman et al. (hereinafter "Zimmerman"). The Applicant respectfully traverses these rejections.


Claim 9 is dependent on independent Claim 1. Claim 22 is dependent on independent Claim 15. Claim 36 is dependent on independent Claim 28. As stated above, Claims 1, 15, and 28 are in a condition for allowance. Accordingly, Claims 9, 22, and 36 are each also allowable as being dependent upon an allowable base claim.

Within the Office Action, it is stated that Claims 10-14, 23-27, 37-41, 45, 51, and 57 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims.

For the reasons given above, Applicant respectfully submits that the claims are in a condition for allowance, and allowance at an early date would be appreciated. Should the Examiner have any questions or comments, the Examiner is encouraged to call the undersigned at (408) 530-9700 to discuss the same so that any outstanding issues can be expeditiously resolved.

Respectfully submitted,
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CERTIFICATE OF MAILING (37 CFR § 1.8(a))

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